

**ABUNDANCE, AGE, SEX, AND SIZE STATISTICS
FOR SOCKEYE SALMON IN LOWER COOK INLET, 1995**



by
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and
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TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES	iv
LIST OF FIGURES.....	vi
LIST OF APPENDICES	vii
ABSTRACT	viii
INTRODUCTION.....	1
METHODS	2
RESULTS.....	5
Southern District Sockeye Salmon	5
Outer District Sockeye Salmon.....	6
Eastern District Sockeye Salmon.....	6
Kamishak Bay District Sockeye Salmon.....	7
Lower Cook Inlet Chum Salmon.....	7
Lower Cook Inlet Pink Salmon	7
DISCUSSION.....	8
LITERATURE CITED	9
APPENDICES.....	36

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Survey methods and total escapement algorithms used for sockeye salmon streams in Lower Cook Inlet, 1995.....	12
2. Survey methods and total escapement algorithms for chum salmon streams in Lower Cook Inlet, 1995	13
3. Survey methods and total escapement algorithms for pink salmon streams in Lower Cook Inlet, 1995	15
4. Commercial sockeye salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1995	17
5. Commercial chum salmon catches and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1995	19
6. Commercial pink salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1995	21
7. Number of readable salmon scales or otoliths, and corresponding confidence levels, for age composition estimates of Lower Cook Inlet Pacific salmon samples, 1995.....	24
8. Age, sex, and size composition of sockeye salmon commercial catch from China Poot Bay, 1995.....	25
9. Age, sex, and size composition of sockeye salmon commercial catch from Neptune Bay, 1995.....	26
10. Age, sex, and size composition of sockeye salmon commercial catch from East Nuka Bay, 1995	27
11. Age, sex, and size composition of sockeye salmon escapement from Delight Lake, 1995.....	28
12. Age, sex, and size composition of sockeye salmon commercial catch from Aialik Bay, 1995	29

13.	Age, sex, and size composition of sockeye salmon commercial catch from Resurrection Bay, 1995.....	30
14.	Age, sex, and size composition of sockeye salmon commercial catch from Kirschner Lake, 1995.....	31
15.	Age, sex, and size composition of sockeye salmon escapement from Chenik Lake, 1995.....	32
16.	Age, sex, and size composition of sockeye salmon commercial from McNeil River Subdistrict (Mikfik Creek), 1995.....	33

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Lower Cook Inlet salmon management districts (not drawn to scale).....	34
2. Location of 9 Lower Cook Inlet salmon catch and escapement areas sampled in 1995.....	35

LIST OF APPENDICES

<u>Appendix</u>	<u>Page</u>
A. China Poot: age, and mean length and weight (\pm Standard Error, SE) of the commercial sockeye salmon catch by brood year and age group. Dashed line indicates missing data; italics indicate escapement data. Calculated means reflect corrections made to previously reported data	37
B. Nuka Bay: age, and mean length and weight (\pm Standard Error, SE) of the commercial sockeye salmon catch by brood year and age group. Dashed line indicates missing data; italics indicate escapement data. Calculated means reflect corrections made to previously reported data	41
C. Aialik Lake: age, and mean length and weight (\pm Standard Error, SE) of the commercial sockeye salmon catch by brood year and age group. Dashed line indicates missing data; italics indicate escapement data. Calculated means reflect corrections made to previously reported data	45
D. Chenik Lake: age, and mean length and weight (\pm Standard Error, SE) of the commercial sockeye salmon catch by brood year and age group. Dashed line indicates missing data; italics indicate escapement data. Calculated means reflect corrections made to previously reported data	49
E. Mikfik Lake: age, and mean length and weight (\pm Standard Error, SE) of the commercial sockeye salmon catch by brood year and age group. Dashed line indicates missing data; italics indicate escapement data. Calculated means reflect corrections made to previously reported data	53
F. Names and locations of files used to generate this report. All files are stored on the hard drive of the Dell Dimension XPS H233 research computer (property number 10074778) and backed up on 3.5" diskettes	57

ABSTRACT

Aerial and foot surveys were used to estimate the 1995 sockeye *Oncorhynchus nerka*, chum *O. keta*, and pink *O. gorbuscha* salmon escapements in the Lower Cook Inlet management area. Age, length, and weight samples were obtained from nine sockeye salmon stocks. A total of 265,423 sockeye, 15,636 chum, and 2,848,464 pink salmon were harvested in this management area. Another 87,541 sockeye, 106,921 chum, and 1,115,449 pink salmon were estimated in the spawning escapement. The dominant ages of sockeye salmon throughout Lower Cook Inlet were 1.2 and 1.3, except for the Hazel Lake Subdistrict, which had a relatively high proportion of age-1.1 sockeye salmon. The proportion of sockeye salmon males ranged from a low of 32% in China Poot Bay catch samples to a high of 56% in the Kirschner Subdistrict catch samples. Sockeye salmon ranged in mean size from 468 mm in Neptune Bay to 546 mm in East Nuka Bay and from 1.54 kg in Mikfik Creek to 2.61 kg in East Nuka Bay. Age, length and weight samples were not collected for pink or chum stocks in 1995 primarily due to reduced fishing effort for these species.

KEY WORDS: Age, chum salmon, escapement, length, Lower Cook Inlet, pink salmon, *Oncorhynchus*, sex, sockeye salmon, weight

INTRODUCTION

The Lower Cook Inlet (LCI) Management Area for salmon is composed of all waters west of Cape Fairfield in the Gulf of Alaska, north of Cape Douglas in Shelikof Straits, and south of Anchor Point in Cook Inlet. The area is divided into four management districts: Kamishak Bay, Southern, Outer, and Eastern (Figure 1). Purse seines and set gillnets are the only legal commercial gear types for salmon. Entry into the commercial fishery was limited in 1972.

In 1961, the Alaska Department of Fish and Game (ADF&G) began documenting LCI commercial catches of the five Pacific salmon species that occur in Alaska. Sockeye *Oncorhynchus nerka* and chum salmon *O. keta* catch sampling for age, weight, length (AWL) and sex began in 1970. AWL data between 1970 and 1986, and between 1988 and 1994, has been summarized by Schroeder (1984, 1985, 1986), Morrison (1987), Yuen et al. (1989, 1990, 1991, 1992), and Yuen and Bucher (1994a, 1994b, 1995). There was no catch-sampling program in 1987. Aerial and ground escapement surveys of pink salmon *O. gorbuscha* began in 1960, chum salmon in 1964, and sockeye salmon in 1969. Annual escapement data are summarized in annual management reports for the Lower Cook Inlet Area (e.g., Bucher and Hammarstrom 1996).

Historically, fishing for a single species within a bay or drainage has lasted three to six weeks. Sockeye salmon fisheries begin as early as June while pink and chum salmon fisheries begin in July. Both fisheries end in August. Commercial fishing for chinook salmon *O. tshawytscha* has begun as early as May, and fishing for coho salmon *O. kisutch* has extended into September. Current management strategy has established fishing districts and sub-districts to facilitate management of discrete stocks. Commercial harvests are managed to meet predetermined escapement goals and to obtain adequate escapement for all run segments of a stock.

The purpose of the Lower Cook Inlet salmon catch-sampling program is to collect sockeye and chum salmon AWL data from purse seine fisheries that target discrete stocks. These single-stock fisheries normally account for over 90% of the total sockeye and chum catch from Lower Cook Inlet. The purse seine fisheries in the Halibut Cove, Halibut Cove Lagoon, Tutka Bay, Douglas River, and the three set gillnet fisheries in Lower Cook Inlet were not sampled because they did not target specific local stocks. Chinook salmon samples also were not collected because total chinook salmon harvest is typically <1% of the total salmon catch. The coho and pink salmon catches normally are not sampled because they exhibit little inter-annual age composition variation.

This report summarizes the 1995 estimates of age and size composition of samples obtained from seven discrete sockeye salmon fisheries and two sockeye salmon spawning populations. Monitoring changes in age composition allows fishery managers to prepare preseason forecasts of abundance and evaluate spawning escapement goals. This report also summarizes methods used to estimate total escapement from aerial and ground surveys.

METHODS

The Lower Cook Inlet salmon harvest has been managed as 16 independent purse seine fisheries, most of which target individual discrete stocks of sockeye, pink or chum salmon, each with their own escapement goal. Individual stocks occurred within distinct geographical sampling strata (Figure 2).

Most catch samples were obtained dockside when tenders were delivering catches from a single fishery. If tenders were expected to gather fish from several fisheries before returning to port, then samples were obtained aboard the tender before salmon from the targeted fishery were placed in the hold. The catch sampling crew interviewed the fishers delivering salmon to determine the origin of the catch before taking samples. If none of the above were possible then samples were obtained from a tender hold provided the skipper was interviewed to confirm that no salmon from an earlier sampling period were present.

There were several sockeye and chum salmon runs which, due to expected low returns, were closed to commercial fishing this year. Thus, age composition estimates were based on a number of scales obtained from escapement samples from Chenik and Delight lakes sockeye salmon.

Salmon were measured from mid-eye to fork of tail (± 1 mm) using a *Limnoterra*² electronic fish measuring board (FMB IV). An *Ohaus*² (Model CT6000-S) electronic balance was used to weigh salmon to the nearest gram. Sex was generally determined from external secondary sexual characteristics (*e.g.* kipe, humped back, etc.). If necessary, a small incision near the vent was made to inspect the gonads and confirm the sex.

Scales were collected from commercial catch and escapement sampled fish to determine age. When possible, scales were collected from the *preferred area* of each salmon: an area 2-3 rows above the lateral line, posterior to the dorsal fin and anterior to the anal fin. Scales were cleaned and mounted sculptured sides up on a gummed card and then heat-pressed onto acetate cards for reading and archival. Images of scale impressions were magnified 35x and projected on a microfiche reader so the number of annuli per scale could be counted to determine age.

We used the European age designation system (Koo 1962). The first digit in this system refers to the number of freshwater annuli, the second digit refers to the number of marine annuli, and the total age is the sum of the two digits plus one. For example, an age-1.2 salmon is a 4-year-old salmon that spent 2 years in fresh water (first winter spent in the gravel as an alevin) and 2 years at sea.

² Vendor or product names are provided to document methods and do not constitute an endorsement by ADF&G.

Age composition sample sizes for scale collections were set for each sampling stratum to estimate age proportions p_i from a population of k age groups simultaneously within a specified distance d of their true population age proportions π_i , 90% of the time ($1 - \alpha$). That is,

$$Pr\left(\bigcap_{i=1}^k |p_i - \pi_i| \leq d\right) \geq 1 - \alpha, \quad 1$$

where d and α were respectively chosen to be 0.05 and 0.10 for all scale samples; $\alpha_i = 2(1 - \Phi(z_i))$, $\sum \alpha_i < \alpha$, $\Phi(z_i)$ = area under the standard normal distribution; and $z_i = d \sqrt{n_i} / \sqrt{p_i(1-p_i)}$. Thompson (1987) calculated a maximum sample size of 403 for a worst-case scenario when three age groups were present in equal numbers, where $d = 0.05$, and $\alpha = 0.10$. Any deviation in the number of age groups or unequal contributions by age group would require a smaller sample size.

Sample sizes for mean weights ranged between 5 and 50 depending on σ . Most sample sizes were around 20 for a 200-salmon sample, or 1 in 10 salmon of each sex.

Estimates of standard errors by age group were derived according to procedures for stratified random sampling described by Snedecor and Cochran (1967):

$$SE = \sqrt{\sum C_h^2 \frac{s_h^2}{n_h}}, \quad 2$$

where C_h^2 = the salmon catch in the h th stratum, and s_h^2 = the sample variance in the h th stratum. Catch totals were obtained from harvest receipts (commonly referred to as fish tickets) which must be used to document each sale by a licensed fisher.

All pink and chum and most sockeye salmon escapement estimates in Lower Cook Inlet were based on periodic counts made by an observer either flying in a fixed-wing aircraft or walking along selected streams (Tables 1, 2, and 3). Sockeye salmon escapement estimates for English Bay, Bear Creek and Chenik Lake were based on counts made at weirs.

Pink and chum salmon generally accumulated in surveyed streams over time, however, many often died before the last survey was completed. Therefore, survey counts were usually adjusted for stream life: the average length of time a spawning pink or chum salmon was alive and available to surveyors. Our method of considering stream life in estimating total pink and chum salmon

escapements was similar to that described by Johnson and Barrett (1988). First, daily surveys were converted to fish-days:

$$fish - days = \frac{(x_i + x_{i-1})}{2} (d_i - d_{i-1}), \quad 3$$

where d_i = Julian calendar date of survey i ($1 < d < 365$) and x_i = number of live pink or chum salmon observed in the study stream during survey i . Then, the area under the fish-day curve is found by integration:

$$area = \sum_{i=1}^{n+1} \frac{(x_i + x_{i-1})}{2} (d_i - d_{i-1}), \quad 4$$

where n = total number of surveys, $x_0 = x_{n+1} = 0$. Pink and chum salmon were not expected to enter streams before 1 July (d_0 = Julian date 191) or after 15 September (d_{n+1} = Julian date 258) unless otherwise noted.

Finally, dividing fish-days by stream life, in this case 17.5 d, yielded total escapement in numbers of salmon:

$$escapement = \frac{\sum_{i=1}^{n+1} \frac{(x_i + x_{i-1})}{2} (d_i - d_{i-1})}{17.5} \quad 5$$

If this estimate was less than the greatest number of salmon observed on any one survey, we used the peak survey count instead of the result from equation (5) as the total escapement estimate. If both aerial and ground surveys were available, we selected the survey we believed to be the most accurate estimate of total escapement.

Sockeye salmon tended to accumulate in surveyed lakes and most were often still alive after the last spawning surveys were completed. Accordingly, peak counts were used as an escapement index for this species, unless otherwise noted.

RESULTS

In 1995, Lower Cook Inlet salmon harvests included: 265,423 sockeye, 15,636 chum, and 2,848,464 pink salmon; total escapements were estimated to be 87,541 sockeye, 106,921 chum, and 1,115,449 pink salmon (Tables 4, 5, and 6, respectively).

Sockeye salmon catch or escapement age, weight, and length (AWL) samples were collected in four commercial fishing districts: Southern, Outer, Eastern and Kamishak (salmon do not return to streams in the Barren Islands District). Samples from sockeye salmon fisheries were obtained between 5 June and 2 August. The commercially harvested stocks sampled represented over 65% of the total Lower Cook Inlet sockeye salmon catch. All but one of the catch samples (Mikfik) met or exceeded the 90% confidence level where $d = 0.05$. One of two escapement samples (Chenik) also met this criterion, while the other (Delight Lake) did not. A total of 4,549 readable scales was collected (Table 7).

Southern District Sockeye Salmon

The only Southern District fisheries assumed to be harvesting discrete sockeye salmon runs occur in China Poot and Neptune bays. The runs originating from Leisure Lake, which drains into China Poot Bay, and Hazel Lake, which drains into Neptune Bay, supported the 2 largest sockeye fisheries in Lower Cook Inlet in 1995. Both of these runs were enhanced by ongoing lake stocking programs that began in 1976 and 1988 respectively. The 1995 common property commercial fisheries in China Poot and Neptune bays harvested 85,819 and 35,126 sockeye salmon respectively, while their respective hatchery cost recovery harvests accounted for an additional 6,434 and 6,063 fish. Biological data on sockeye salmon returning to China Poot and Neptune bays have been collected since 1980 and 1993, respectively (Appendix A). The mean sockeye weight in our catch samples was 1.67 kg ($n=55$) for China Poot and 1.57 kg ($n=99$) for Neptune. The mean sockeye length in our catch samples was 482 mm ($n=557$) for China Poot and 468 mm ($n=541$) for Neptune. China Poot catch samples consisted of 82.3% age-1.2 sockeye salmon and 68.5% females; whereas Neptune samples consisted of 80.7% age-1.2 fish and 53.3% females (Tables 8 and 9, respectively). Since a barrier falls prevents upstream spawning migration into Leisure Lake, efforts were made to harvest all returning sockeye salmon in that terminal fishery.

The Halibut Cove purse seine fishery exploits mixed stocks and harvested 8,986 sockeye salmon in 1995. Mixed stocks were also harvested in various set gillnet fisheries. Reported harvests of sockeye salmon were 3,080 near Barabara Creek, 12,326 in Kasitsna/Tutka bays, and 4,245 and 2,580 in Seldovia and English bays respectively. The only large spawning escapement of sockeye salmon in the Southern District occurred in the English Bay River drainage where 22,467 sockeye salmon passed through the weir (Paul McCollum, Chugach Regional Resources Commission, personal communication).

Outer District Sockeye Salmon

Wild runs in Nuka Bay supported a commercial harvest of 17,626 sockeye salmon in 1995. Biological data on sockeye salmon returning to Nuka Bay have been collected since 1984 (Appendix B). Sockeye salmon in East Nuka Bay catch samples had a mean length of 546 mm (n=790) and a mean weight of 2.61 kg (n=81; Table 10). The total sample consisted of 61.9% age-1.3 and 37.0% age-1.2 sockeye salmon and was comprised of 59.5% females. Escapement scale samples were obtained from 86 sockeye salmon in Delight Lake on 19 July. Delight Lake had an escapement index of 15,780 sockeye salmon. The sample from this lake consisted of 59.18% age-1.2 and 40.82% age-1.3 sockeye salmon with an overall mean length of 520 mm (n=86; Table 11). No weight data were obtained from Delight Lake fish. No appreciable harvests occurred elsewhere in the Outer District in 1995; escapement indices to Desire and Delusion (a.k.a. Ecstasy) lakes were 15,800 and 1,520, respectively.

Eastern District Sockeye Salmon

Few wild sockeye salmon returned to Aialik Lake in Aialik Bay this year. The commercial fishery harvested only 1,971 sockeye salmon and the escapement index was 2,620. Commercial catch scale samples indicated that the predominant ages were 1.3, 1.2, and 2.2 (Table 12). The mean length and weight of commercially caught sockeye salmon sampled from Aialik Bay was 532 mm (n=530) and 2.52 kg (n=56). Biological data on sockeye salmon returning to Aialik Lake have been collected since 1983 (Appendix C).

The enhanced run in Resurrection Bay supported a commercial harvest of 23,655 and a hatchery cost recovery harvest of 20,930 fish; 8,328 sockeye salmon were counted through the weir into Bear Lake (Jeff Hetrick, CIAA, personal communication). The mean size of commercially caught sockeye salmon in Resurrection Bay was 532 mm (n=816) and 2.37 kg (n=105). The commercial catch sample consisted of 73.4% age-1.3 and 21.8% age-1.2 sockeye salmon (Table 13).

Kamishak Bay District Sockeye Salmon

Three sockeye salmon stocks in the Kamishak Bay District were sampled in 1995. The enhanced Kirschner Lake run produced a common property fishery harvest of 11,110 and a hatchery cost recovery harvest of 5,350 with no escapement associated with this terminal fishery. The Chenik Subdistrict remained closed due to the small run of 1,086 sockeye salmon counted past the Chenik Creek weir. Only 136 sockeyes were harvested from the McNeil River Subdistrict and 10,050 sockeyes escaped into Mikfik Lake. The Douglas River Subdistrict produced a catch of 3,429 sockeye salmon, however, no samples were collected. The stream of origin for the catches made in the Douglas River Subdistrict is unknown.

A catch sample from Kirschner Lake was obtained on 13 July. Females comprised 43.8% of the sample. The mean length of sampled fish was 490 mm (n=585) and the mean weight was 1.89 kg (n=58; Table 14). Age-1.2 sockeye salmon comprised 85.8% of the sample, followed by age-1.3 (9.4%) and age-2.2 (4.7%) returnees.

Chenik Lake's natural run was supplemented with hatchery-reared sockeye juveniles as early as 1978, however, the run has been extremely weak in recent years due to an IHN epizootic. Between 15-27 July 1995 we live sampled just 606 fish at the Chenik Lake weir. Age-1.3 and -1.2 sockeye salmon comprised 73.3% and 26.1% of the samples respectively (Table 15). Males represented 54.3% of the sampled run. Sampled fish averaged 531 mm in length and 1.89 kg in weight (n=525). Biological data on sockeye salmon returning to Chenik Lake have been collected since 1985 (Appendix D).

A small catch sample (119 fish) of Mikfik sockeyes was obtained on 17 June. Age-1.3, -1.2 and -2.3 sockeye salmon comprised 52.2%, 38.2%, and 4.4% of the sample respectively (Table 16). Females represented 52.2% of the sample. Sockeye salmon in the sample had a mean length of 479 mm (n=119) and a mean weight of 1.53 kg (n=119; Table 16). Biological data on sockeye salmon returning to Mikfik Lake have been collected almost every year since 1986 (Appendix E). Escapement indices to other Kamishak District streams included 200 sockeyes in Iniskin Bay/North Head Creek, 1,300 in Ursus Cove Lagoon Creek, 5,000 in Bruin Bay, 300 in Bruin River, and 2,390 in Amakdedori Creek.

LOWER COOK INLET CHUM SALMON

A combination of poor market conditions and reduced returns to some drainages precluded many fishers from targeting chum salmon in 1995. Consequently, no catch or escapement samples were collected from LCI chum salmon. About 2/3 of the commercial chum catch (10,302 fish) occurred in the Kamishak Bay District and was distributed between six major stocks (Table 5). Most of the remaining harvest occurred in the Southern District (4,530 fish) in Tutka and Seldovia bays. The 15,636 fish total harvest for 1995 represents only 15% of the 20-year average catch for this species (Bucher and Hammarstrom 1996).

LOWER COOK INLET PINK SALMON

Virtually all pink salmon exhibit a two-year life cycle so catch samples typically are not collected to determine age composition of returning stocks. However, catch and escapement data are compiled to facilitate in-season management of the commercial fishery and to forecast the following year's return (Otis 1997). The third highest catch on record occurred in 1995 with 2.85 million pink salmon being harvested throughout LCI. Almost 90% of the total harvest occurred in

the Southern District, largely as a result of Tutka Hatchery production (Bucher and Hammarstrom 1996). About half of the Southern District catch went to Tutka Hatchery cost recovery and brood stock collection. The Outer District supported the greatest commercial catch of wild fish with 192,000 pinks being harvested amongst six major stocks (Table 6). Most major pink producing streams in LCI met or exceeded their escapement thresholds; several west side Cook Inlet streams exceeded their goals by nearly an order of magnitude.

DISCUSSION

Sockeye salmon mean lengths and weights within a brood year are expected to increase with increasing ocean age. For example, age-1.1, -1.2, and -1.3 Aialik Lake male sockeye salmon from the 1980 brood year had mean lengths progressing from 356 mm to 516 mm to 570 mm, while those from the 1981 brood year had mean lengths progressing from 401 to 501 to 567 mm (Appendix C). Whenever this trend was not observed, data were examined for keypunch errors, and scales were re-examined for aging errors. Unfortunately, we could not locate archived data sheets, scale cards or acetate impressions in a few instances for which mean length or weight did not increase with age. For example, age-1.3 and -1.4 Aialik female sockeye salmon from the 1978 brood year decreased in length from 558 to 547 mm (Appendix C). This was most likely due to a few age-1.3 females from the 1984-catch sample being incorrectly aged as age-1.4 females. However, without access to original data forms, scale cards, or acetate impressions, we have not been able to re-examine these data.

Occasional anomalies occurred in the freshwater residency period for some stocks. For example, Aialik Bay returns have been dominated by age-1. fish since catch sampling began there in 1983. However, 52.9% and 65.5% of juvenile sockeye remained in Aialik Lake a second year and smolted as age-2. fish in 1990 and 1991, respectively. East Nuka Bay returns experienced similar occurrences in 1988 and 1994. Inter-annual variation in age compositions is relatively common within sockeye salmon stocks (Burgner 1991), however, causal mechanisms are not fully understood. While size may not be the sole determinant for smoltification, Weatherly and Gill (1995) report that growth is an important component influencing the duration of freshwater residence of sockeye salmon. Burgner (1991) lists several factors which may influence the freshwater growth of sockeye salmon, including: abundance and availability of food, temperature conditions, length of growing season, intensity of available light, competition, disease, feeding behavior in relation to predators, and movements to favorable habitats for feeding and survival.

While the overall sex ratio of returning adult salmon is typically even, males generally dominate the early portion of a run and females the latter, particularly for chum and pink salmon. Thus, the date samples are collected relative to the timing of the spawning run can influence the observed sex ratio of the sample. This temporal bias probably caused the skewed sex ratio observed in our 1995

sample from Aialik Bay (65% females; Table 12). The sample was collected on 11 July, late in the Aialik run. Because temporal biases can occur and size-at-age differences exist between male and female sockeye salmon (Burgner 1991), sampling dates are reported and age-weight-length data are stratified by sex in the appendices.

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Table 1. Survey methods and total escapement algorithms used for sockeye salmon streams in Lower Cook Inlet, 1995.

Stream	Survey Method	Total Escapement Algorithm
<i>Southern District</i>		
Clearwater Slough	ground	peak live count
Humpy Creek	ground	peak live count
China Poot Bay	ground	peak live count
Barabara Creek	ground	peak live count
Port Graham River	ground	peak live count
English Bay	weir	sum of daily weir counts
<i>Outer District</i>		
Port Chatham	ground	peak live count
Windy Creek Left	ground	peak live count
Windy Creek Right	ground	peak live count
Port Dick Head End Creek	ground	peak live count
Port Dick Island Creek	ground	peak live count
Desire Lake	aerial	peak live count
Delight Lake	aerial	peak live count
Ecstasy Lake	aerial	peak live count
<i>Eastern District</i>		
Aialik Lake	aerial	peak live count
Salmon Creek	ground	peak live count
Grouse Creek	ground	peak live count
Bear Creek	weir	sum of daily weir counts
<i>Kamishak Bay District</i>		
Ursus Lagoon	aerial	peak live count
Bruin Lake Creek	aerial	peak live count
Bruin Bay	aerial	peak live count
Amakdedori Creek	aerial	peak live count
Chenik Lake	weir	sum of daily weir counts
Paint River	aerial	peak live count
Mikfik Creek	aerial	peak live count
Little Kamishak River	aerial	peak live count
Douglas Reef	aerial	peak live count

Table 2. Survey methods and total escapement algorithms used for chum salmon streams in Lower Cook Inlet, 1995.

Stream	Survey Method	Total Escapement Algorithm	Start/Stop Dates Area-Under-Curve
<i>Southern District</i>			
Humpy Creek	ground	17.5 d stream life	7/1 - 9/15
China Poot Bay	ground	peak carcass count	
Tutka Creek	ground	17.5 d stream life	7/1 - 9/15
Seldovia River	ground	17.5 d stream life	7/1 - 9/20
Port Graham Left	ground	peak live and carcass count	
Port Graham River	ground	17.5 d stream life	7/1 - 9/15
<i>Outer District</i>			
Dogfish Bay	ground	17.5 d stream life	7/1 - 9/15
Port Chatham	ground	17.5 d stream life	7/1 - 9/15
Windy River Left	ground	17.5 d stream life	7/1 - 9/15
Windy River Right	ground	17.5 d stream life	7/1 - 9/15
Rocky River	aerial	17.5 d stream life	7/1 - 9/15
Port Dick-Head End Creek	ground	17.5 d stream life	7/1 - 9/15
Port Dick-Slide Creek	ground	17.5 d stream life	7/1 - 9/15
Port Dick-Middle Creek	aerial	17.5 d stream life	7/1 - 9/15
Port Dick-Island Creek	ground	17.5 d stream life	7/1 - 9/30
Petrof River	aerial	17.5 d stream life	7/1 - 9/15
Nuka Island South Creek	aerial	17.5 d stream life	7/1 - 9/15
James Lagoon	aerial	17.5 d stream life	7/1 - 9/15
<i>Eastern District</i>			
Tonsina Creek	ground	17.5 d stream life	7/1 - 9/30
Tonsina Left Creek	ground	17.5 d stream life	7/1 - 9/30
Salmon Creek	ground	peak carcass count	
Clear Creek	ground	17.5 d stream life	7/1 - 9/15
Sawmill Creek	ground	17.5 d stream life	7/1 - 9/15
Spring Creek	ground	17.5 d stream life	7/1 - 9/15
<i>Kamishak Bay District</i>			
Iniskin River	aerial	17.5 d stream life	7/1 - 9/30
Sugarloaf Creek	aerial	17.5 d stream life	8/1 - 9/30
North Head Creek	aerial	17.5 d stream life	8/1 - 9/30
Cottonwood Creek	aerial	17.5 d stream life	8/1 - 9/30
Brown Peak Creek	aerial	17.5 d stream life	7/1 - 9/15
Ursus Lagoon Right-hand	aerial	17.5 d stream life	7/26 - 9/30

Table 2 cont'd. (page 2 of 2)

Stream	Survey Method	Total Escapement Algorithm	Start/Stop Dates Area-Under-Curve
<i>Kamishak Bay District</i>			
Ursus Lagoon	aerial	17.5 d stream life	7/26 - 9/30
Sunday Creek	aerial	17.5 d stream life	7/1 - 9/15
Bruin Bay	aerial	17.5 d stream life	7/1 - 9/15
McNeil River ^a	aerial	17.5 d stream life	6/13 - 9/15
Little Kamishak River	aerial	17.5 d stream life	6/29 - 9/15
Strike Creek	aerial	17.5 d stream life	7/1 - 9/15
Big Kamishak River	aerial	17.5 d stream life	7/1 - 9/15
Douglas Reef	aerial	17.5 d stream life	7/1 - 9/15
Douglas Beach	aerial	17.5 d stream life	6/29 - 9/15

^aMcNeil River chum salmon aerial survey counts are only considered to be an index of abundance. In some years, the estimated number of salmon consumed by bears in McNeil River Wildlife Sanctuary has exceeded the peak aerial survey count.

Table 3. Survey methods and total escapement algorithms used for pink salmon streams in Lower Cook Inlet, 1995.

Stream	Survey Method	Total Escapement Algorithm	Start/Stop Dates Area Under Curve
<i>Southern District</i>			
Humpy Creek	ground	17.5-d stream life	7/15 - 9/15
Halibut Cove Lagoon	aerial	17.5-d stream life	7/1 - 9/15
China Poot Bay	ground	17.5-d stream life	8/1 - 9/15
Tutka Creek	ground	17.5-d stream life	7/1 - 9/15
Seldovia River	ground	17.5-d stream life	7/1 - 9/20
Barabara Creek	ground	17.5-d stream life	7/1 - 9/30
Port Graham Left	ground	17.5-d stream life	8/1 - 8/30
Port Graham River	ground	17.5-d stream life	7/1 - 9/15
<i>Outer District</i>			
Dogfish Bay	ground	17.5-d stream life	7/1 - 9/15
Port Chatham	ground	17.5-d stream life	7/1 - 9/15
Chugach Bay	aerial	17.5-d stream life	7/1 - 9/15
Windy River Left	ground	17.5-d stream life	7/27 - 9/15
Windy River Right	ground	peak live = carcass count	
Scurvy Creek	ground	17.5-d stream life	7/1 - 9/15
Rocky River	aerial	17.5-d stream life	7/1 - 9/15
Port Dick-Head End Creek	ground	17.5-d stream life	7/1 - 9/30
Port Dick-Slide Creek	ground	17.5-d stream life	7/1 - 9/15
Port Dick-Middle Creek	ground	17.5-d stream life	7/1 - 9/15
Port Dick-Island Creek	ground	17.5-d stream life	7/1 - 9/30
Nuka Island South Creek	ground	17.5-d stream life	7/1 - 9/15
Berger Bay	aerial	17.5-d stream life	7/1 - 9/15
James Lagoon	aerial	17.5-d stream life	7/1 - 9/15
<i>Eastern District</i>			
Humpy Cove	ground	17.5-d stream life	8/1 - 9/30
Tonsina Creek	ground	17.5-d stream life	7/1 - 9/30
Tonsina Left Creek	ground	17.5-d stream life	8/1 - 9/30
Salmon Creek	ground	17.5-d stream life	8/1 - 9/30
Grouse Creek	ground	peak live + carcass count	
Lost Creek	ground	peak live + carcass count	
Clear Creek	ground	17.5-d stream life	8/1 - 9/20
Sawmill Creek	ground	17.5-d stream life	8/1 - 9/30
Spring Creek	ground	17.5-d stream life	8/1 - 9/30
Thumb Cove	ground	17.5-d stream life	7/15 - 9/30

Table 3 cont'd. (page 2 of 2)

<u>Stream</u>	<u>Survey Method</u>	<u>Total Escapement Algorithm</u>	<u>Start/Stop Dates Area Under Curve</u>
<i>Kamishak Bay District</i>			
Sugarloaf Creek	aerial	peak live count	
North Head Creek	aerial	17.5-d stream life	8/1 - 9/15
Brown Peak Creek	aerial	17.5-d stream life	7/1 - 9/15
Ursus Lagoon Righthand	aerial	peak live count	
Ursus Lagoon	aerial	17.5-d stream life	7/1 - 9/15
Sunday Creek	aerial	17.5-d stream life	7/1 - 9/15
Bruin Bay	aerial	17.5-d stream life	7/1 - 9/15
Amakgedori Creek	aerial	17.5-d stream life	7/1 - 9/15

Table 4. Commercial sockeye salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1995*.

Subdistrict/System	Catch	Escapement ^a	Total Run
SOUTHERN DISTRICT			
Humpy Creek	139		139
Halibut Cove	8,986		8,986
China Poot Bay			
Common Property Fishery	85,819		
Hatchery Cost Recovery	6,434		
China Poot Creek		450 ^b	
Total Run			92,703
Neptune Bay			
Common Property Fishery	35,126		
Hatchery Cost Recovery	6,063		
Total Run			41,189
Tutka/Kasitsna Bays	12,326 ^c		12,326
Barabara Creek	3,080		3,080
Seldovia Bay	4,245		4,245
English Bay	<u>2,580</u>	<u>22,467^d</u>	<u>25,047</u>
SOUTHERN DISTRICT TOTAL	164,798	22,917	187,715
OUTER DISTRICT			
Port Chatham	5		5
Chugach Bay	2		2
Windy Bay	8		8
Rocky Bay	1		1
East Arm Nuka Bay (McCarty Fiord)	17,626		
Delight Lake		15,780	
Desire Lake		15,800	
Delusion Lake		<u>1,520</u>	
Total Run			<u>50,726</u>
OUTER DISTRICT TOTAL	17,642	33,100	50,742
EASTERN DISTRICT			
Aialik Bay	1,971	2,620	4,591
Resurrection Bay North			
Common Property Fishery	23,655		
Hatchery Cost Recovery	20,930		
Bear Lake		8,328 ^d	
Total Run	<u> </u>	<u> </u>	<u>52,913</u>
EASTERN DISTRICT TOTAL	46,556	10,948	57,504

Table 4 cont'd. (page 2 of 2)

Subdistrict/System	Catch	Escapement ^a	Total Run
KAMISHAK BAY DISTRICT			
Iniskin Bay/North Head Creek		200	200
Ursus Cove Lagoon Creek	5	1,300	1,305
Rocky Cove	7		7
Kirschner Lake			
Common Property Fishery	11,110		
Hatchery Cost Recovery	5,350		
Total Run			16,460
Bruin Bay	17,146		
Bruin Lake Creek		5,000 ^b	
Bruin River		300	
Total Run			22,446
Chenik Lake			
Amakdedori Creek		2,390	
Chenik Creek/Lake		1,086 ^d	
Total Run			3,476
Paint River		250 ^e	250
McNeil Cove (Mikfik Creek/Lake)	136	10,050	10,186
Kamishak/Douglas Reef	2		2
Douglas River/Silver Beach	2,671		2,671
KAMISHAK BAY DISTRICT TOTAL	36,427	20,576	57,003
TOTAL LOWER COOK INLET	265,423	87,541	352,964

*Source: Bucher and Hammarstrom (1996).

^a Escapement estimates derived from limited aerial surveys. Numbers represent unexpanded aerial live counts.

^b No freshwater escapement, prevented by barrier falls.

^c Figure includes 3 sockeyes taken during hatchery pink salmon cost recovery.

^d Weir counts.

^e No freshwater escapement, ladder not opened during 1995.

^f Insufficient survey data to generate escapement information.

Table 5. Commercial chum salmon catches and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1995*.

Subdistrict/System	Catch	Escapement ^a	Total Run
SOUTHERN DISTRICT			
Humpy Creek	1	103	104
Halibut Cove	33		33
China Poot Bay	90		90
Neptune Bay	10		10
Tutka Bay	1,620		
Tutka Lagoon Creek		18	
Jakalof Creek		189	
Total Run			1,827
Barabara Creek	679		679
Seldovia Bay & River	1,389	1,805	3,194
Port Graham & River		3,837	3,837
English Bay	<u>708</u>		<u>708</u>
SOUTHERN DISTRICT TOTAL	4,530	5,952	10,482
OUTER DISTRICT			
Dogfish Bay		4,189	4,189
Port Chatham	33	547	580
Chugach Bay	2		2
Windy Bay	298		
Windy Right Creek		948	
Windy Left Creek		465	
Total Run			1,711
Rocky Bay & River	65	5,132	5,197
Port Dick	0		
Port Dick (head end) Creek		3,306	
Slide Creek		1,072	
Middle Creek		354	
Island Creek		7,667	
Total Run			12,399
Nuka Island/Petrof River	0	950	950
East Arm Nuka Bay/James Lagoon	<u>76</u>	<u>129</u>	<u>205</u>
OUTER DISTRICT TOTAL	474	24,759	25,233

-continued-

Table 5 cont'd. (page 2 of 2)

Subdistrict/System	Catch	Escapement ^a	Total Run
EASTERN DISTRICT			
Aialik Bay	58		58
Resurrection Bay North	272		
Mayor Creek		2	
Sawmill Creek		85	
Spring Creek		193	
Tonsina Creek		3,224	
Tonsina Left Creek		4	
Thumb Cove		52	
Total Run			<u>3,832</u>
EASTERN DISTRICT TOTAL	330	3,560	3,890
KAMISHAK BAY DISTRICT			
Iniskin Bay	0		
Iniskin River		22,667	
Sugarloaf Creek		2,045	
North Head Creek		523	
Total Run			25,235
Cottonwood Bay & Creek	2,376	12,020	14,396
Ursus Cove	254		
Brown's Peak Creek		500	
Ursus Lagoon Right Creek		3,614	
Ursus Cove Lagoon Creek		7,439	
Total Run			11,807
Rocky Cove/Sunday Creek	1,939	2,831	4,770
Kirschner Lake	769 ^b		769
Bruin Bay & River	4,138	6,600	10,738
McNeil River	3	14,411	14,414
Kamishak/Douglas Reef	78		78
Douglas River/Douglas Beach Creek	745	^c	745
KAMISHAK BAY DISTRICT TOTAL	10,302	72,650	82,952
TOTAL LOWER COOK INLET	15,636	106,921	122,557

*Source Bucher and Hammarstrom (1996).

^a Escapement estimates are derived from periodic ground or aerial surveys with stream life factors applied.

^b Kirschner Lake catches include 2 chums taken during hatchery sockeye salmon cost recovery.

^c Insufficient survey data to generate escapement estimates for Little and Big Kamishak Rivers, Strike Creek, and Douglas Beach Creek.

Table 6. Commercial pink salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict, Lower Cook Inlet, 1995*.

Subdistrict/System	Catch	Escapement ^a	Total Run
SOUTHERN DISTRICT			
Humpy Creek	13,693	89,293	102,986
Halibut Cove	1,854		1,854
China Poot Bay/Creek	7,812 ^b	1,953	9,765
Neptune Bay	5,101 ^b		5,101
Tutka/Kasitsna Bays			
Common Property Fishery	1,212,342		
Hatchery Cost Recovery	1,213,322		
Hatchery Brood Stock		166,052	
Tutka Lagoon Creek		15,899	
Jakalof Creek		669	
Total Run			2,608,284
Barabara Creek	2,806	10,831	13,637
Seldovia Bay & River	8,214	48,519	56,733
Port Graham			
Hatchery Brood Stock		16,224 ^c	
Port Graham River		10,030	
Port Graham Left		1,300	
Total Run			27,554
English Bay	<u>10,168</u>	<u> </u>	<u>10,168</u>
SOUTHERN DISTRICT TOTAL	2,475,312	360,770	2,836,082
OUTER DISTRICT			
Dogfish Bay		13,286	13,286
Port Chatham	17,618	13,950	31,568
Chugach Bay	8,408	7,811	16,219
Windy Bay	111,219		
Windy Right Creek		11,415	
Windy Left Creek		31,594	
Total Run			154,228
Rocky Bay	27,456		
Scurvy Creek		1,086	
Rocky River		56,266	
Total Run			84,808
Port Dick	0		
Port Dick (head end) Creek		6,644	
Slide Creek		444	
Island Creek		10,563	
Total Run			17,651

Table 6 cont'd. (page 2 of 3)

Subdistrict/System	Catch	Escapement*	Total Run
OUTER DISTRICT (cont'd)			
Nuka Island	5,993		
South Nuka Island Creek		6,160	
Berger Bay		434	
Mike's Bay		3,234	
Home Cove		651	
Total Run			16,472
East Arm Nuka Bay (McCarty Fiord)	21,404		
Delight Lake		2,550	
James Lagoon		579	
Total Run			24,233
OUTER DISTRICT TOTAL	192,098	166,667	358,765
EASTERN DISTRICT			
Aialik Bay	11,999	1,140	13,139
Resurrection Bay North	1		
Bear/Salmon Creeks		38,649	
Clear Creek		1,903	
Grouse Creek		2,584	
Lost Creek		1,236	
Sawmill Creek		60	
Spring Creek		1,073	
Tonsina Creek		435	
Tonsina Left Creek		22	
Humpy Cove		1,766	
Thumb Cove		9,326	
Total Run			57,055
EASTERN DISTRICT TOTAL	12,000	58,194	70,194
KAMISHAK BAY DISTRICT			
Iniskin Bay			
North Head Creek		26,009	
Sugarloaf Creek		111	
Total Run			26,120
Ursus Cove/Brown's Peak Creek	8,327	96,652	104,979
Rocky Cove/Sunday Creek	49,683	95,906	145,589
Kirschner Lake	19,095 ^d		19,095
Bruin Bay & River	85,705	307,309	393,014
Chenik Lake/Amakdedori Creek		4,500	4,500

-continued-

Table 6 cont'd. (page 3 of 3)

Subdistrict/System	Catch	Escapement ^a	Total Run
KAMISHAK BAY DISTRICT (cont'd)			
Kamishak/Douglas Reef	1,944		1,944
Douglas River/Silver Beach	<u>4,300</u>		<u>4,300</u>
KAMISHAK BAY DISTRICT TOTAL	169,054	530,487	699,541
TOTAL LOWER COOK INLET	2,848,464	1,115,449	3,963,914

* Source: Bucher and Hammarstrom (1996).

^a Escapement estimates are derived from periodic ground or aerial surveys with stream life factors applied.

^b China Poot/Neptune catches include 4/16 pinks (respectively) caught during hatchery sockeye salmon cost recovery.

^c Brood stock figure for Port Graham Hatchery includes 948 pinks that died due to suffocation during capture.

^d Kirschner catches include 14 pinks caught during hatchery sockeye salmon cost recovery.

Table 7. Number of readable salmon scales and corresponding confidence levels, for age composition estimates of Lower Cook Inlet sockeye salmon samples, 1995.

Fishery	Sample			Confidence Interval ($d = 0.05$) ^a
	Dates	Size	Type	
Sockeye Salmon				
China Poot Bay	25 July - 2 August	557	scale	0.935
Neptune Bay	28 July - 1 August	541	scale	0.448
Nuka Bay	27 June - 11 July	790	scale	0.947
Delight Lake	19 July	86	scale	0.027 (0.898 if $d = 0.10$)
Aialik	11 July	530	scale	0.890 (0.999 if $d = 0.10$)
Resurrection Bay	5 June - 8 June	816	scale	0.912
Kirschner Lake	13 July	585	scale	0.981
Chenik Lake	15 July - 27 July	525	scale	0.867
Mikfik Creek	17 June	119	scale	0.915
Total				4,549

^a Simultaneous confidence interval for multiple age classes (Thompson 1987).

Table 8. Age, sex, and size composition of sockeye salmon commercial catch from China Poot Bay, 1995.

	Age Composition by Brood Year						total
	1.1	1.2	2.1	1.3	2.2	1.4	
Sample Period : 25 July - 2 August							
Males	3,478	21,200	497	3,147	662		28,984
Percent	3.77	22.98	0.54	3.41	0.72		31.42
Sample Size	21	128	3	19	4		175
Mean Length	391	478	403	520	497		471
Std. Error	3	1	4	4	9		1
Sample Size	21	128	3	19	4		175
Mean Weight	0.99	1.70					1.60
Std. Error	0.04	0.06					0.05
Sample Size	2	12					14
Females		54,656	166	7,619	662	166	63,269
Percent		59.25	0.18	8.26	0.72	0.18	68.58
Sample Size		330	1	46	4	1	382
Mean Length		481	387	528	466	492	486
Std. Error		1		4	8		1
Sample Size		330	1	46	4	1	382
Mean Weight		1.65	0.77	2.13	1.33		1.70
Std. Error		0.03		0.21	0.11		0.04
Sample Size		33	1	5	2		41
Both Sexes	3,478	75,856	663	10,766	1,324	166	92,253
Percent	3.77	82.23	0.72	11.67	1.44	0.18	100.00
Sample Size	21	458	4	65	8	1	557
Mean Length	391	480	399	525	482	492	482
Std. Error	3	0	4	3	6		0
Sample Size	21	458	4	65	8	1	557
Mean Weight	0.99	1.66	0.77	2.13	1.33		1.67
Std. Error	0.04	0.03		0.21	0.11		0.03
Sample Size	2	45	1	5	2		55

Table 9. Age, sex, and size composition of sockeye salmon commercial catch from Neptune Bay, 1995.

	Age Composition by Brood Year					
	1.1	1.2	2.1	1.3	2.2	total
Sample Period : 28 July - 1 August						
Males	5,558	13,019	152	381	76	19,186
Percent	13.49	31.61	0.37	0.93	0.18	46.58
Sample Size	73	171	2	5	1	252
Mean Length	391	477	419	556	548	453
Std. Error	1	1	7	14		1
Sample Size	73	171	2	5	1	252
Mean Weight	0.97	1.71	1.10	2.30		1.50
Std. Error	0.02	0.05		0.11		0.03
Sample Size	22	30	1	2		55
Females	381	20,252		1,294	76	22,003
Percent	0.93	49.17		3.14	0.18	53.42
Sample Size	5	266		17	1	289
Mean Length	390	479		537	492	481
Std. Error	5	1		6		1
Sample Size	5	266		17	1	289
Mean Weight	0.98	1.65			1.80	1.64
Std. Error		0.03				0.03
Sample Size	1	42			1	44
Both Sexes	5,939	33,271	152	1,675	152	41,189
Percent	14.42	80.78	0.37	4.07	0.37	100.00
Sample Size	78	437	2	22	2	541
Mean Length	391	478	419	541	520	468
Std. Error	1	0	7	6		0
Sample Size	78	437	2	22	2	541
Mean Weight	0.97	1.67	1.10	2.30	1.80	1.57
Std. Error	0.02	0.03		0.11		0.02
Sample Size	23	72	1	2	1	99

Table 10. Age, sex, and size composition of sockeye salmon commercial catch from East Nuka Bay, 1995.

	Age Composition by Brood Year					total
	1.2	1.3	2.2	1.4	2.3	
Sample Period : 27 June - 11 July						
Males	2,588	4,508	22		22	7,140
Percent	14.68	25.58	0.12		0.12	40.51
Sample Size	116	202	1		1	320
Mean Length	524	580	548		578	560
Std. Error	2	1				1
Sample Size	116	202	1		1	320
Mean Weight	2.35	3.21				2.90
Std. Error	0.07	0.08				0.06
Sample Size	15	22				37
Females	3,927	6,403	67	22	67	10,486
Percent	22.28	36.33	0.38	0.12	0.38	59.49
Sample Size	176	287	3	1	3	470
Mean Length	505	556	530	604	570	537
Std. Error	1	1	26		0	0
Sample Size	176	287	3	1	3	470
Mean Weight	2.14	2.57				2.41
Std. Error	0.07	0.05				0.04
Sample Size	18	26				44
Both Sexes	6,515	10,911	89	22	89	17,626
Percent	36.96	61.90	0.50	0.12	0.50	100.00
Sample Size	292	489	4	1	4	790
Mean Length	513	566	534	604	572	546
Std. Error	1	0	26		0	0
Sample Size	292	489	4	1	4	790
Mean Weight	2.22	2.83				2.61
Std. Error	0.05	0.04				0.03
Sample Size	33	48				81

Table 11. Age, sex, and size composition of sockeye salmon escapement from Delight Lake, 1995.

Age Composition by Brood Year			
	1.2	1.3	total
Sample Period : 19 July			
Males	3,119	2,569	5,688
Percent	19.77	16.28	36.05
Sample Size	17	14	31
Mean Length	512	550	529
Std. Error	6	8	5
Sample Size	17	14	31
Females	6,239	3,853	10,092
Percent	39.54	24.42	63.95
Sample Size	34	21	55
Mean Length	495	546	514
Std. Error	3	2	2
Sample Size	34	21	55
Both Sexes	9,358	6,422	15,780
Percent	59.30	40.70	100.00
Sample Size	51	35	86
Mean Length	500	547	520
Std. Error	3	3	2
Sample Size	51	35	86

Table 12. Age, sex, and size composition of sockeye salmon commercial catch from Aialik Bay, 1995.

	Age Composition by Brood Year						total
	1.1	1.2	1.3	2.2	1.4	2.3	
Sample Period : 11 July							
Males	4	238	408	4		4	658
Percent	0.20	12.08	20.70	0.20		0.20	33.38
Sample Size	1	64	110	1		1	177
Mean Length	337	513	568	534		611	547
Std. Error		3	2				1
Sample Size	1	64	110	1		1	177
Mean Weight		2.47	3.28				2.98
Std. Error		0.14	0.10				0.08
Sample Size		4	16				20
Females	4	573	709	19	4	4	1,313
Percent	0.20	29.07	35.97	0.96	0.20	0.20	66.62
Sample Size	1	154	191	5	1	1	353
Mean Length	515	497	548	496	542	518	525
Std. Error		1	1	15			1
Sample Size	1	154	191	5	1	1	353
Mean Weight		2.02	2.52	1.81			2.29
Std. Error		0.05	0.07				0.05
Sample Size		13	22	1			36
Both Sexes	8	811	1,117	23	4	8	1,971
Percent	0.41	41.15	56.67	1.17	0.20	0.41	100.00
Sample Size	2	218	301	6	1	2	530
Mean Length	426	502	555	503	542	564	532
Std. Error		1	1	15			1
Sample Size	2	218	301	6	1	2	530
Mean Weight		2.15	2.90	1.81			2.52
Std. Error		0.05	0.06				0.04
Sample Size		17	38	1			56

Table 13. Age, sex, and size composition of sockeye salmon commercial catch from Resurrection Bay, 1995.

	Age Composition by Brood Year							total
	1.1	0.3	1.2	1.3	2.2	1.4	2.3	
Sample Period : 5 June - 8 June								
Males	109	219	3,934	13,714	219	55	546	18,796
Percent	0.24	0.49	8.82	30.76	0.49	0.12	1.22	42.16
Sample Size	2	4	72	251	4	1	10	344
Mean Length	379	509	511	553	540	546	575	543
Std. Error	11	5	3	2	13		12	1
Sample Size	2	4	72	251	4	1	10	344
Mean Weight		2.32	2.03	2.66			3.45	2.54
Std. Error		0.06	0.16	0.08			0.20	0.07
Sample Size		2	5	32			2	41
Females		273	5,792	19,013	492	55	164	25,789
Percent		0.61	12.99	42.64	1.10	0.12	0.37	57.84
Sample Size		5	106	348	9	1	3	472
Mean Length		507	501	532	510	601	512	524
Std. Error		12	2	1	9		6	1
Sample Size		5	106	348	9	1	3	472
Mean Weight			1.94	2.34	2.21	2.89	2.17	2.25
Std. Error			0.07	0.05				0.04
Sample Size			17	44	1	1	1	64
Both Sexes	109	492	9,726	32,727	711	110	710	44,585
Percent	0.24	1.10	21.81	73.40	1.59	0.25	1.59	100.00
Sample Size	2	9	178	599	13	2	13	816
Mean Length	379	508	505	541	519	573	560	532
Std. Error	11	7	2	1	7		9	1
Sample Size	2	9	178	599	13	2	13	816
Mean Weight		2.32	1.98	2.47	2.21	2.89	3.15	2.37
Std. Error		0.06	0.08	0.05			0.20	0.04
Sample Size		2	22	76	1	1	3	105

Table 14. Age, sex, and size composition of sockeye salmon commercial catch from Kirschner, 1995.

Age Composition by Brood Year					
	1.1	1.2	1.3	2.2	total
Sample Period : 13 July					
Males	28	7,934	732	563	9,257
Percent	0.17	48.20	4.45	3.42	56.24
Sample Size	1	282	26	20	329
Mean Length	379	487	528	503	491
Std. Error		1	4	4	1
Sample Size	1	282	26	20	329
Mean Weight		1.87	2.52	2.13	1.94
Std. Error		0.04	0.31	0.05	0.04
Sample Size		31	2	3	36
Females		6,190	816	197	7,203
Percent		37.61	4.96	1.20	43.76
Sample Size		220	29	7	256
Mean Length		484	529	502	490
Std. Error		1	5	9	1
Sample Size		220	29	7	256
Mean Weight		1.77	2.35	1.82	1.84
Std. Error		0.07	0.19		0.06
Sample Size		17	4	1	22
Both Sexes	28	14,124	1,548	760	16,460
Percent	0.17	85.81	9.40	4.62	100.00
Sample Size	1	502	55	27	585
Mean Length	379	486	528	503	490
Std. Error		0	3	4	0
Sample Size	1	502	55	27	585
Mean Weight		1.83	2.43	2.05	1.89
Std. Error		0.04	0.18	0.05	0.03
Sample Size		48	6	4	58

Table 15. Age, sex, and size composition of sockeye salmon escapement from Chenik Lake, 1995.

Age Composition by Brood Year					
	1.2	1.3	2.2	2.3	total
Sample Period : 15 July - 27 July					
Males	165	421		4	590
Percent	15.19	38.77		0.37	54.33
Sample Size	80	203		2	285
Mean Length	504	558		541	542
Std. Error	3	1		9	1
Sample Size	80	203		2	285
Mean Weight	1.65	2.25		2.05	2.08
Std. Error	0.03	0.02		0.25	0.02
Sample Size	80	203		2	285
Females	118	374	2	2	496
Percent	10.87	34.44	0.18	0.18	45.67
Sample Size	57	181	1	1	240
Mean Length	478	531	470	544	518
Std. Error	3	1			1
Sample Size	57	181	1	1	240
Mean Weight	1.29	1.77	1.10	1.80	1.65
Std. Error	0.03	0.02			0.01
Sample Size	57	181	1	1	240
Both Sexes	283	795	2	6	1,086
Percent	26.06	73.20	0.18	0.55	100.00
Sample Size	137	384	1	3	525
Mean Length	493	545	470	542	531
Std. Error	2	1		9	1
Sample Size	137	384	1	3	525
Mean Weight	1.50	2.02	1.10	1.97	1.89
Std. Error	0.02	0.01		0.25	0.01
Sample Size	137	384	1	3	525

Table 16. Age, sex, and size composition of sockeye salmon commercial catch from McNeil River subdistrict (Mikfik Creek), 1995.

Age Composition by Brood Year							
	1.1	0.3	1.2	1.3	2.2	2.3	total
Sample Period : 17 June							
Males	1		21	36	2	5	65
Percent	0.74		15.44	26.47	1.47	3.68	47.79
Sample Size	1		18	32	2	4	57
Mean Length	332		433	515	443	501	492
Std. Error			6	5	18	7	3
Sample Size	1		18	32	2	4	57
Mean Weight	0.52		1.17	1.93	1.27	1.78	1.63
Std. Error			0.07	0.09	0.18	0.09	0.06
Sample Size	1		18	32	2	4	57
Females		1	31	35	3	1	71
Percent		0.74	22.79	25.74	2.21	0.74	52.21
Sample Size		1	27	30	3	1	62
Mean Length		510	444	502	459	510	475
Std. Error			5	3	17		3
Sample Size		1	27	30	3	1	62
Mean Weight		1.71	1.21	1.64	1.29	1.72	1.44
Std. Error			0.05	0.03	0.09		0.03
Sample Size		1	27	30	3	1	62
Both Sexes	1	1	52	71	5	6	136
Percent	0.74	0.74	38.24	52.21	3.68	4.41	100.00
Sample Size	1	1	45	62	5	5	119
Mean Length	332	510	440	509	453	502	479
Std. Error			4	3	12	7	2
Sample Size	1	1	45	62	5	5	119
Mean Weight	0.52	1.71	1.19	1.79	1.28	1.77	1.53
Std. Error			0.04	0.05	0.09	0.09	0.03
Sample Size	1	1	45	62	5	5	119

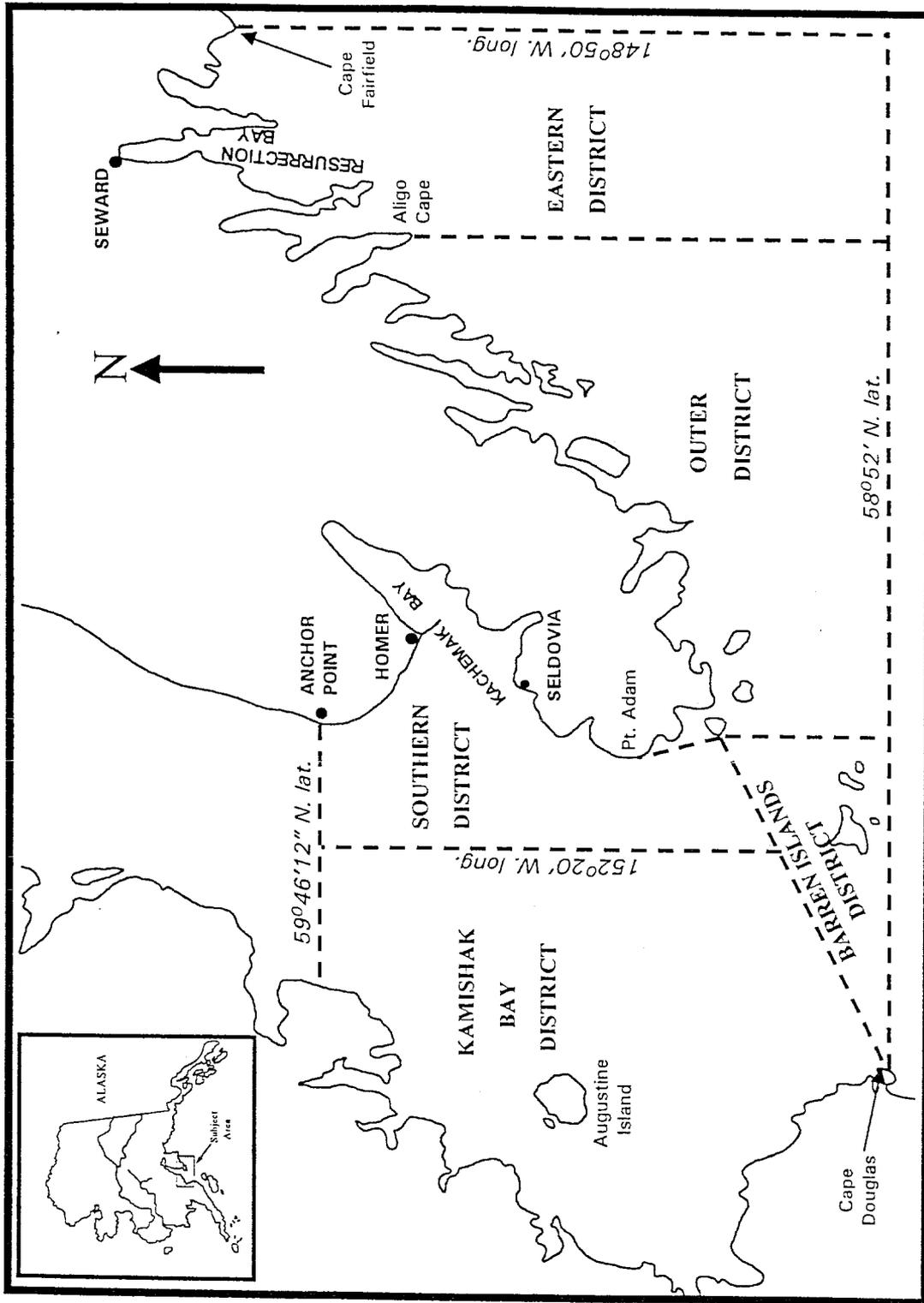


Figure 1. Lower Cook Inlet salmon management districts (not drawn to scale).

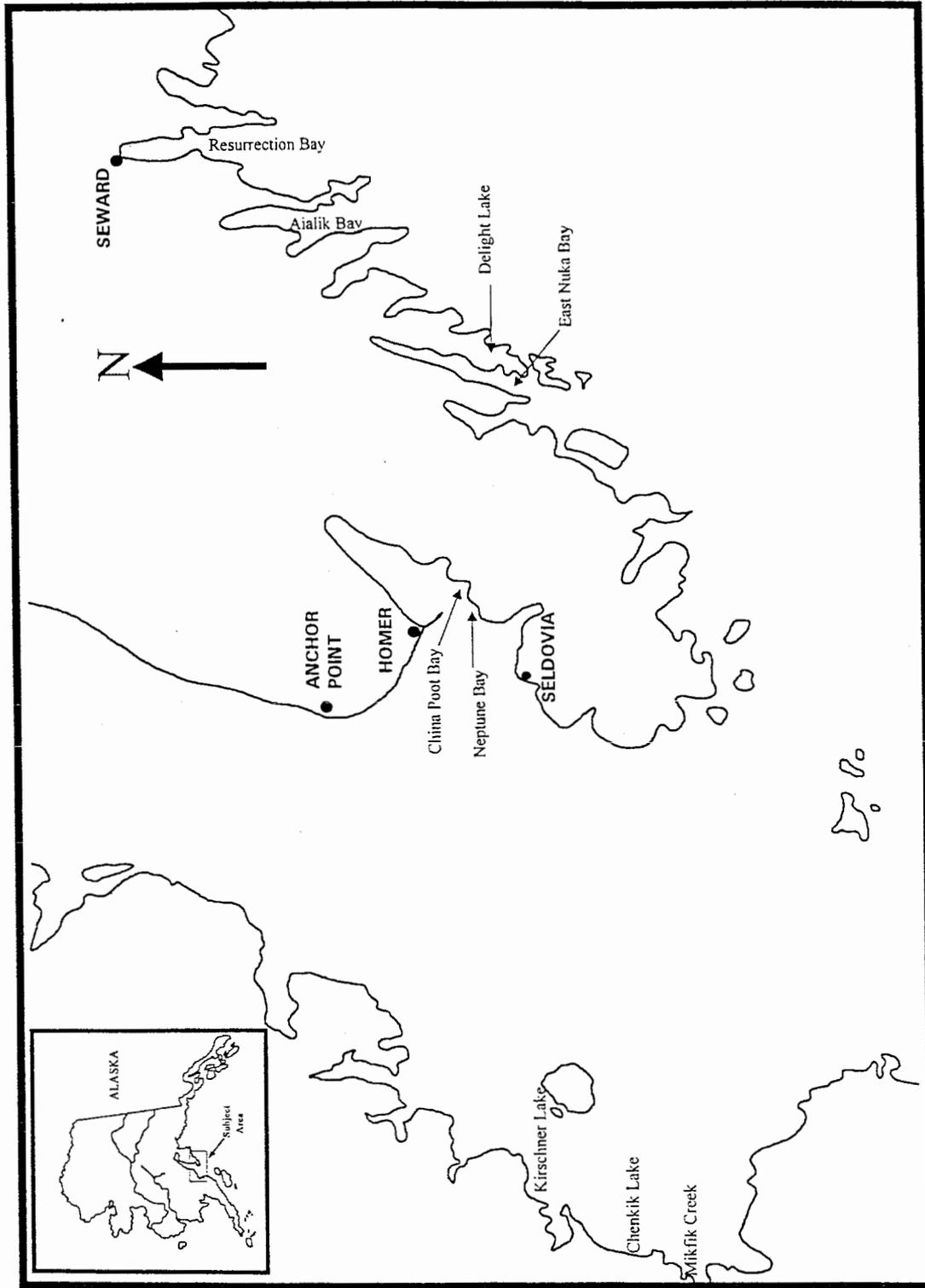


Figure 2. Location of 9 Lower Cook Inlet salmon catch and escapement areas sampled in 1995.

APPENDICES

Year	Brood			Age Group			Age Group		
	11	12	13	14	15	16	17	18	19
	n	SE	n	SE	n	SE	n	SE	n

Male mean weight (kg) by brood year

1975	2.20	NA	1	-----	2.65	NA	1	-----	2.17	0.06	26
1976	2.17	0.14	18	-----	2.66	0.12	8	3.85	NA	1	7
1977	2.14	0.02	193	-----	2.26	0.11	7	-----	2.43	0.04	24
1978	2.02	0.02	178	-----	2.00	0.10	2	-----	2.45	0.18	11
1979	2.00	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2
1980	1.96	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2
1981	1.96	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2
1982	1.96	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2
1983	1.96	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2
1984	1.96	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2
1985	1.96	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2
1986	1.96	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2
1987	1.96	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2
1988	1.96	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2
1989	1.96	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2
1990	1.96	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2
1991	1.96	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2
1992	1.96	0.12	7	-----	2.00	0.10	2	-----	2.00	0.10	2

Female mean weight (kg) by brood year

1975	2.40	0.40	2	-----	1.95	0.15	2	-----	2.70	NA	1
1976	2.00	0.06	31	-----	2.03	0.18	2	-----	2.03	0.18	2
1977	1.98	0.11	24	-----	2.03	0.18	2	-----	2.03	0.18	2
1978	2.85	0.55	2	2.50	NA	1	-----	2.03	0.18	2	
1979	1.98	0.02	231	-----	1.97	0.09	14	-----	2.88	0.08	3
1980	1.90	0.03	118	-----	2.26	0.06	26	-----	2.26	0.06	26
1981	2.11	0.02	32	-----	1.70	NA	1	-----	1.70	NA	1
1982	1.80	0.46	3	-----	2.07	0.12	22	-----	2.20	NA	2
1983	-----	-----	-----	-----	2.07	0.12	22	-----	2.07	0.12	22
1984	1.77	0.06	13	-----	2.75	NA	1	-----	2.75	NA	1
1985	1.76	0.05	8	-----	1.51	0.06	6	-----	1.51	0.06	6
1986	1.49	0.05	17	2.10	0.30	2	-----	1.63	0.09	16	
1987	1.57	0.04	22	2.10	0.09	3	-----	1.72	0.03	15	
1988	1.67	0.05	16	2.51	-----	-----	-----	1.72	0.03	15	
1989	1.54	0.16	7	-----	1.25	0.11	2	-----	1.25	0.11	2
1990	1.15	0.07	11	2.13	0.21	5	-----	1.33	0.11	2	
1991	1.65	0.03	33	-----	0.77	NA	1	-----	0.77	NA	1
1992	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

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Brood Year	Age Group												
	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3
Male harvest (number of fish) by brood year													
1975					152								
1976				5,620	136								
1977				3,394			272		266				
1978					133			266	216				
1979				32,845	1,941	190		1,509					
1980			635	55,632	6,444			8,528					
1981				15,161	4,781								
1982				6,694					1,406				
1983					1,326			17,249					
1984				12,862	1,324		1,174	2,592	68				384
1985			1,126	16,595	1,823		35	2,904	322				
1986			153	7,429	2,141		203	16,172	386				
1987			540	25,628	1,157		452	15,044					
1988				16,073	2,295		643	2,868	88				
1989			1,543	19,789	2,821		287	970					
1990			287	13,225	3,147			662					
1991				21,200			497						
1992			3,478										
Female harvest (number of fish) by brood year													
1975					456			304					
1976				5,468									
1977				6,926			272		133				
1978					266	216		266					
1979				39,360	647			4,097	569				
1980				40,106	5,117			6,633					
1981				14,783				956					
1982				2,869		56			514				
1983					1,567			14,203	229				
1984				11,876	915		113	1,567	68				192
1985			56	12,078	1,283			4,457	619				
1986				11,008	3,015			17,386	129				
1987				22,622	1,029			14,400					
1988				13,244	2,008			2,008	88				
1989				38,146	3,527	166		1,322					
1990				6,966	7,619		176	662					
1991				54,656			166						
1992													

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Year	Age Group																					
	1.1	n	1.2	n	1.3	n	1.4	n	2.1	n	2.2	n	2.3	n	2.4	n	3.1	n	3.2	n	3.3	n
Male age composition by harvest year																						
1980			46.83	37	1.27	1																
1981			30.95	25	1.24	1			2.47	2												
1982																						
1983	0.90	5	44.27	247	0.18	1					0.36	2	0.36	2								
1984			53.31	258	1.86	9					1.45	7	0.21	1								
1985			26.40	80	11.22	34	0.33	1			14.85	45										
1986			43.75	7	31.25	5																
1987																						
1988	1.77	20	20.25	204	2.09	19			1.85	20	27.15	256	2.21	21								
1989	0.43	4	46.36	439	3.70	35			0.10	1	7.24	70	0.86	8								
1990	1.81	8	24.94	110	6.12	27			0.68	3	9.75	43	0.23	1								
1991			28.82	259	2.41	22			0.51	7	18.18	171	0.36	4					0.43	2		
1992	2.42	12	25.25	125	1.82	9			1.01	5	23.64	117	0.61	3								
1993																						
1994			45.32	150	9.67	32					3.32	11	0.30	1								
1995	3.77	21	22.98	128	3.41	19			0.54	3	0.72	4										
Female age composition by harvest year																						
1980			45.57	36	3.80	3					2.53	2										
1981			62.96	51					2.47	2												
1982																						
1983			53.05	296	0.36	2					0.36	2	0.18	1								
1984			38.43	186	0.62	3	0.21	1			3.93	19										
1985			25.74	78	8.91	27					11.55	35	0.99	3								
1986			18.75	3							6.25	1										
1987																						
1988	0.09	1	18.69	197	2.47	23	0.09	1	0.18	2	22.36	217	0.81	8								
1989			33.74	319	2.56	23					4.38	41	0.64	6								
1990			36.96	163	4.31	19					14.96	66	0.23	1								
1991			25.44	193	3.39	25					19.55	151	0.70	4					0.22	1		
1992			20.81	103	1.62	8					22.62	112	0.2	1								
1993																						
1994			23.87	79	12.09	40			0.6	2	4.53	15	0.3	1								
1995			59.25	330	8.26	46	0.18	1	0.18	1	0.72	4										
Both Sexes																						
1980			92.40	73	5.07	4					2.53	2										
1981			93.81	76	1.24	1			4.94	4												
1982																						
1983																						
1984			91.74	444	2.48	12	0.21	1			5.38	26	0.21	1								
1985			52.14	158	20.13	61	0.33	1			26.40	80	0.99	3								
1986			62.50	10	31.25	5					6.25	1										
1987																						
1988	1.86	21	38.94	401	4.56	42	0.09	1	2.03	22	49.51	473	3.02	29								
1989	0.43	4	80.10	758	6.26	58			0.10	1	11.62	111	1.50	14								
1990	1.81	8	61.90	273	10.43	46			0.68	3	24.71	109	0.46	2								
1991			54.26	452	5.80	47			0.51	7	37.73	322	1.06	8					0.65	3		
1992	2.42	12	46.06	228	3.44	17			1.01	5	46.26	229	0.81	4								
1993																						
1994			69.19	229	21.76	72			0.60	2	7.85	26	0.60	2								
1995	3.77	21	82.23	458	11.67	65	0.18	1	0.72	4	1.44	8										

Appendix B. East Nuka Bay; age, and mean length and weight (± Standard Error; SE) of the commercial sockeye salmon catch by brood year and age group. Dashed line indicates missing data; italics indicate escapement data. (Calculated means reflect correct corrections made to previously reported data.)

Year	Age Group									
	0.2 SE	0.3 SE	0.4 SE	0.5 SE	0.6 SE	0.7 SE	0.8 SE	0.9 SE	1.0 SE	1.1 SE
1970										
1971										
1972										
1973										
1974										
1975										
1976										
1977										
1978										
1979										
1980										
1981										
1982										
1983										
1984										
1985										
1986										
1987										
1988										
1989										
1990										
1991										
1992										

Male mean length (mm) by brood year

Female mean length (mm) by brood year

Age Group

-continued-

Appendix B. cont'd (Nuka Bay: page 3 of 4).

Year	Age Group											3.3		
	0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4		3.1	3.2
Male harvest (number of fish) by brood year														
1977														209
1978														---
1979										2,713				---
1980						30,057			2,922					28
1981					3,757									---
1982										1,993				---
1983						1,123			562	466				7
1984					281	2,579			93	242			4	---
1985		31			1,398	1,401			453	216				---
1986	31	14			408	358			82					---
1987					56									728
1988						478			166	196				---
1989		28			353	1,054			588	22				---
1990					710	4,508		24	22					---
1991					2,588									---
1992														---
Female harvest (number of fish) by brood year														
1977														209
1978														---
1979										4,592				---
1980						33,395			6,053					28
1981	209				7,514								28	---
1982										1,854				---
1983						1,544			1,011	870				15
1984					674	2,734	5	28	280	320			4	---
1985		31			1,740	1,789	4		501	279				---
1986	31	28			567	494			142					---
1987					112									713
1988						471			208	220			12	---
1989					367	1,053	22		968	67				---
1990	7				1,103	6,403			67					---
1991					3,917									---
1992														---

Appendix B. cont'd (Nuka Bay: page 4 of 4).

Year	Age Group															
	0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3		
Male age composition by harvest year																
1977		0.65	2	1.29	4	18.06	56		1.61	5	19.03	59	0.32	1	0.65	2
1983	0.38	1	1.13	3	13.21	35	19.25	51	8.68	23	1.13	3				
1984					29.90	154	11.46	59	0.39	2						
1985					4.10	18	32.80	144			1.55	8	3.69	19		
1986											3.19	14	2.96	13		0.23
1987																
1988					3.06	10	12.23	40	6.12	20	21.71	71				0.30
1989	0.30	1	0.30	1	13.60	45	25.09	83	0.90	3	4.53	15				
1990					7.12	65	34.46	229	7.91	76	4.22	43				
1991					3.16	15	20.19	96	4.62	22	12.18	58	0.23	1	0.39	2
1992																
1993																
1994					11.98	58	17.78	86	0.40	2	9.92	48	3.31	16		
1995					14.68	116	25.38	202	0.12	1	0.12	1				
Female age composition by harvest year																
1977		0.65	2	2.58	8	29.67	92	0.32	579		1.29	4	22.90	71	0.32	1
1983	1.13	3		18.12	48	26.41	70	0.38	1	0.38	1	8.68	23	1.13	3	
1984				30.88	159	15.92	82	0.39	2		3.30	17	1.94	10	0.39	2
1985	0.23	1		8.20	36	36.45	160				6.61	29	5.01	22		0.23
1986																
1987																
1988					7.34	24	16.82	55	0.30	1	11.01	36	20.19	66	0.30	1
1989	0.30	1	0.30	1	16.91	56	26.60	88	2.71	9	8.46	28				
1990					9.90	93	31.23	296	0.09	1	8.75	87	5.59	56		
1991					6.32	30	27.86	133	0.23	1	8.01	38	15.74	75	0.23	1
1992																
1993																
1994					18.61	90	17.76	86			16.33	79	3.71	18		0.20
1995					22.28	176	36.33	287	0.12	1	0.38	3	0.38	3		
Both Sexes																
1977		1.30	4	3.87	12	47.73	148	0.32	579		2.90	9	41.93	130	0.64	2
1983	0.38	1	2.26	6	31.33	83	45.66	121	0.38	1	17.36	46	2.26	6		0.97
1984					60.78	313	27.38	141	0.78	4	4.85	25	5.63	29	0.39	2
1985					12.30	54	69.25	304			9.80	43	7.97	35		0.46
1986																
1987																
1988					10.40	34	29.05	95	0.30	1	17.13	56	41.90	137	0.30	1
1989	0.60	2	0.60	2	30.51	101	51.69	171	3.61	12	12.99	43				0.60
1990					17.02	158	55.69	525	0.09	1	16.66	163	9.81	99		
1991					9.18	45	18.05	229	0.23	1	12.63	60	27.92	133	0.46	2
1992																
1993																
1994					30.59	148	35.54	172	0.40	2	26.25	127	7.02	34		0.20
1995					36.96	292	61.91	489	0.12	1	0.50	4	0.50	4		

Appendix C. Atliik Bay: age, and mean length and weight (\pm Standard Error, SE) of the commercial sockeye salmon catch by brood year and age group. Dashed line indicates missing data; italics indicate escapement data. Calculated means reflect corrections made to previously reported data.

Year	0.2		0.3		0.4		1.1		1.2		1.3		1.4		2.1		2.2		2.3			
	n	SE	n	SE	n	SE	n	SE	n	SE	n	SE	n	SE	n	SE	n	SE	n	SE		
1978	6	12.59	4	5.86	4	7.28	534	7.28	22	5.81	4.90	22	5.81	4.90	22	5.81	4.90	22	5.81	4.90	22	5.81
1979	20	6.34	8	5.82	8	7.06	529	7.06	1	5.81	2.43	93	648	NA	1	5.81	2.43	93	648	NA	1	5.81
1980	20	6.34	8	5.82	8	7.06	529	7.06	1	5.81	2.43	93	648	NA	1	5.81	2.43	93	648	NA	1	5.81
1981	1	4.98	1	4.98	1	4.98	1	4.98	1	4.98	1	4.98	1	4.98	1	4.98	1	4.98	1	4.98	1	4.98
1982	33	5.00	33	5.00	33	5.00	33	5.00	33	5.00	33	5.00	33	5.00	33	5.00	33	5.00	33	5.00	33	5.00
1983	39	5.00	39	5.00	39	5.00	39	5.00	39	5.00	39	5.00	39	5.00	39	5.00	39	5.00	39	5.00	39	5.00
1984	12	9.00	12	9.00	12	9.00	12	9.00	12	9.00	12	9.00	12	9.00	12	9.00	12	9.00	12	9.00	12	9.00
1985	103	3.00	103	3.00	103	3.00	103	3.00	103	3.00	103	3.00	103	3.00	103	3.00	103	3.00	103	3.00	103	3.00
1986	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA
1987	478	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA
1988	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA
1989	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA
1990	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA
1991	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA
1992	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA	1	NA

Female mean length (mm) by brood year

-continued-

Year	0.2			0.3			0.4			1.1			1.2			1.3			1.4			2.1			2.2			2.3		
	n	SE	SE	n	SE	SE	n	SE	SE	n	SE	SE	n	SE	SE	n	SE	SE	n	SE	SE	n	SE	SE	n	SE	SE			
1978	1	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1979	14	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1980	14	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1981	14	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1982	4	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1983	2	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1984	1	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1985	17	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1986	17	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1987	17	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1988	17	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1989	17	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1990	17	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1991	17	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76
1992	17	NA	2.90	3	0.21	2.67	8	0.10	1.16	0.10	1.16	8	0.10	1.16	0.10	1.16	0.10	1.16	1	NA	4.80	1	NA	2.37	2	0.28	2.37	2	0.14	3.76

Male mean weight (kg) by brood year

Female mean weight (kg) by brood year

Year	0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3
Age Group														
Male harvest (number of fish) by brood year														
1978														
1979														
1980														
1981														
1982														
1983														
1984														
1985														
1986														
1987														
1988														
1989														
1990														
1991														
1992														
Female harvest (number of fish) by brood year														
1978														
1979														
1980														
1981														
1982														
1983														
1984														
1985														
1986														
1987														
1988														
1989														
1990														
1991														
1992														

Appendix C. cont'd. (Alik Bay: page 4 of 4)

Year	Age Group																	
	0.2	0.3	0.4	n	1.1	n	1.2	n	1.3	n	1.4	n	2.1	n	2.2	n	2.3	n
Male age composition by harvest year																		
1983					0.71	2	31.79	89	7.86	22					1.43	4		
1984					0.22	1	25.61	116	20.53	93					1.77	8	1.32	6
1985							5.35	17	26.73	85	0.32	1	0.32	1	9.43	30	6.29	20
1986							7.55		9.90						5.70		26.85	
1987																		
1988							12.50	58	15.73	73					1.94	9	7.11	31
1989							4.06	65	36.12	214					0.97	19	1.99	39
1990	0.18	1	0.18	1			13.75	73	9.41	50	0.38	2			23.74	126	2.37	12
1991							6.10	29	7.99	38					4.64	22	21.69	103
1992							2.68		44.60								2.72	
1993																		
1994																		
1995					0.20	1	12.08	64	20.70	110					0.20	1	0.20	1
Female age composition by harvest year																		
1983							42.50	119	15.36	43					0.36	1		
1984							25.83	117	22.07	100	1.10	5			0.88	4	0.66	3
1985					0.32	1	5.35	17	32.39	103					5.97	19	7.55	24
1986							5		12						7		26	
1987																		
1988					0.22	1	23.71	110	23.70	110					3.67	17	11.42	53
1989							4.32	70	49.92	274					1.38	27	1.08	21
1990							12.43	66	10.54	56	0.18	1			25.80	137	1.13	6
1991							6.10	29	14.31	68					7.78	37	31.38	149
1992							3		45								3	
1993																		
1994																		
1995					0.20	1	29.07	154	35.97	191	0.20	1			0.96	5	0.20	1
Both Sexes																		
1983					0.71	2	74.29	208	23.22	65					1.79	5		
1984					0.22	1	51.44	233	42.60	193	1.10	5			2.65	12	1.98	9
1985					0.32	1	10.70	34	59.12	188	0.32	1	0.32	1	15.40	49	13.84	44
1986																		
1987																		
1988					0.22	1	36.21	168	39.43	183					5.61	26	18.53	86
1989																		
1990	0.18	1	0.18	1			26.18	139	19.95	106	0.56	3			49.54	263	3.40	18
1991							12.20	58	22.30	106					12.42	59	53.07	252
1992							5.40	2	89.20	33					5.40	2		2
1993																		
1994					0.40	2	70.37	190	18.89	51					7.28	21	2.96	8
1995					0.40	2	41.15	218	56.67	301	0.20	1			1.16	6	0.40	2

-End-

Appendix D. Chertik, age, and mean length and weight (± Standard Error, SE) of the commercial sockeye salmon catch by brood year and age group. Dashed line indicates missing data; italics indicate escapement data. Calculated means reflect corrections made to previously reported data.

Year	Age Group						Male mean length (mm) by brood year						Female mean length (mm) by brood year						
	0.2	0.3	0.4	0.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	
	n	SE	n	SE	n	SE	n	SE	n	SE	n	SE	n	SE	n	SE	n	SE	
1992																			
1991																			
1990																			
1989																			
1988																			
1987																			
1986																			
1985																			
1984																			
1983																			
1982																			
1981																			
1980																			
1979																			
1978																			

-continued-

Year	Age Group						Male mean weight (kg) by brood year						Female mean weight (kg) by brood year									
	0.2	0.3	0.4	1.1	1.2	1.4	n	SE	n	SE	n	SE	n	SE	n	SE	n	SE	n	SE		
1978	2.05	2.05	2.05	2.64	2.64	2.64	36	0.05	2.64	0.05	2.64	0.05	46	0.04	2.05	0.04	46	0.04	2.05	0.04	46	0.04
1979	2	2	2	2.05	2.05	2.05	2	0.06	2.05	0.06	2.05	0.06	3	0.06	2.02	0.06	3	0.06	2.02	0.06	3	0.06
1980	1.76	1.76	1.76	2.81	2.81	2.81	27	0.03	2.81	0.03	2.81	0.03	27	0.06	2.44	0.06	27	0.06	2.44	0.06	27	0.06
1981	2.08	2.08	2.08	2.20	2.20	2.20	4	0.06	2.20	0.06	2.20	0.06	4	0.06	2.02	0.06	4	0.06	2.02	0.06	4	0.06
1982	1.64	1.64	1.64	1.64	1.64	1.64	81	0.03	1.64	0.03	1.64	0.03	49	0.06	2.60	0.06	49	0.06	2.60	0.06	49	0.06
1983	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1984	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1985	1.71	1.71	1.71	2.50	2.50	2.50	9	0.12	2.50	0.12	2.50	0.12	3	0.14	2.37	0.14	3	0.14	2.37	0.14	3	0.14
1986	1.82	1.82	1.82	1.82	1.82	1.82	21	0.06	1.82	0.06	1.82	0.06	21	0.05	1.71	0.05	21	0.05	1.71	0.05	21	0.05
1987	1.40	1.40	1.40	2.10	2.10	2.10	16	0.04	2.10	0.04	2.10	0.04	16	0.10	2.10	0.10	16	0.10	2.10	0.10	16	0.10
1988	1.60	1.60	1.60	2.11	2.11	2.11	24	0.07	2.11	0.07	2.11	0.07	24	0.06	2.11	0.06	24	0.06	2.11	0.06	24	0.06
1989	1.37	1.37	1.37	2.19	2.19	2.19	44	0.20	2.19	0.20	2.19	0.20	44	0.05	2.19	0.05	44	0.05	2.19	0.05	44	0.05
1990	1.56	1.56	1.56	2.35	2.35	2.35	203	0.02	2.35	0.02	2.35	0.02	203	0.02	2.35	0.02	203	0.02	2.35	0.02	203	0.02
1991	1.65	1.65	1.65	1.65	1.65	1.65	80	0.03	1.65	0.03	1.65	0.03	80	0.03	1.65	0.03	80	0.03	1.65	0.03	80	0.03
1992	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

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Appendix D cont'd (Chenik: page 3 of 4).

Year	Age Group													
	0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3
Male harvest (number of fish) by brood year														
1979														
1980						3,875								
1981					750	3,322			6,091					
1982					59,250		187				414			
1983						63,150			2,951	2,504				
1984					9,843	8,860		1,079	4,333	588				
1985					4,430	9,577			1,120	900				
1986		451			24,897	10,395								
1987	90				14,192	3,953								
1988					4,199	11,986			274					
1989					1,464			46						
1990														
1991														
1992														
Female harvest (number of fish) by brood year														
1979							42			125				
1980						4,916			125					
1981		83			708	1,661			4,430					
1982					36,546						904			
1983						65,687			6,063	1,541				
1984					13,882	6,644			4,526	361				
1985					5,971	10,870		96	1,159	300				
1986		632			20,602	14,792			800	49				
1987					9,395	2,717								
1988					3,460	9,287			46					
1989					1,464									
1990														
1991														
1992														

-continued-

Appendix D cont'd (Chenik: page 4 of 4).

Year	Age Group																			
	0.2	n	0.3	n	0.4	n	1.1	n	1.2	n	1.3	n	1.4	n	2.1	n	2.2	n	2.3	n
Male age composition by harvest year																				
1983								12.57	20	22.64	36									
1984								55.20	122	1.81	4									
1985								7.06	18	36.47	93									
1986								53.23	214	2.98	12						5.47	22		
1987																				
1988								6.00	83	38.47	441	0.11	1	0.66	8	1.80	21	0.25	3	
1989								11.39	46	22.77	92					11.14	45	6.44	26	
1990	0.13	1	0.64	5				35.39	327	13.61	114					1.59	16	0.84	7	
1991								27.41	142	20.08	104					1.93	10	1.74	9	
1992								29.20	85	27.49	80									
1993								5.96	32	48.79	262			0.19	1	1.12	6			
1994								50.74	144	15.59	44	0.37	1			0.37	1			
1995								15.19	80	38.77	203								0.37	2
Female age composition by harvest year																				
1983								35.86	57	28.93	46									
1984								41.18	91	1.81	4									
1985			0.78	2				6.66	17	46.27	118	0.40	1			1.18	3	1.18	3	
1986								32.84	132	1.49	6					3.98	16			
1987																				
1988								8.46	111	40.01	520					3.69	48	0.35	5	
1989								15.35	62	17.08	69			0.25	1	11.63	47	3.96	16	
1990			0.90	7				29.29	272	15.45	125					1.65	15	0.51	4	
1991								18.15	94	28.57	148					1.55	8	0.58	3	
1992								24.06	70	18.90	55								0.34	1
1993								5.96	32	37.80	203					0.19	1			
1994								18.44	52	13.74	39					0.74	2			
1995								10.87	57	34.44	181					0.18	1	0.18	1	
Both Sexes																				
1983								48.43	77	51.57	82									
1984								96.38	213	3.62	8									
1985			0.78	2				13.72	35	82.74	211	0.40	1			1.18	3	1.18	3	
1986								86.07	346	4.47	18					9.45	38			
1987																				
1988								14.46	194	78.48	961	0.11	1	0.66	8	5.49	69	0.80	8	
1989								26.74	108	39.85	161			0.25	1	22.77	92	10.40	42	
1990	0.13	1	1.54	12				64.68	399	29.06	239					3.24	31	1.35	11	
1991								45.56	236	48.65	252					3.48	18	2.32	12	
1992								53.26	155	46.39	135							0.34	1	
1993								11.92	64	86.59	465			0.19	1	1.31	7			
1994								69.18	196	29.33	83	0.37	1			1.11	3			
1995								26.06	137	73.21	384					0.18	1	0.53	3	

Appendix E. Mink: age, and mean length and weight (\pm Standard Error; SE) of the commercial sockeye salmon catch by brood year and age group. Dashed line indicates missing data, italics indicate escapement data. Calculated means reflect corrections made to previously reported data.

Year	Age Group										
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
	n	SE	n	SE	n	SE	n	SE	n	SE	
1969	515*	N/A	1		505	N/A	1		520	14	3
1970	502.6*	15.45	5	516	N/A	1		469	8	5	
1971	453.7	23.9	3								
1972											
1973											
1974											
1975											
1976											
1977											
1978											
1979											
1980											
1981											
1982											
1983											
1984											
1985											
1986											
1987											
1988											
1989											
1990											
1991											
1992											

Female mean length (mm) by brood year											
Year	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
	n	SE	n	SE	n	SE	n	SE	n	SE	
1969	515*	N/A	1		505	N/A	1		520	14	3
1970	502.6*	15.45	5	516	N/A	1		469	8	5	
1971	453.7	23.9	3								
1972											
1973											
1974											
1975											
1976											
1977											
1978											
1979											
1980											
1981											
1982											
1983											
1984											
1985											
1986											
1987											
1988											
1989											
1990											
1991											
1992											

Male mean length (mm) by brood year											
Year	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
	n	SE	n	SE	n	SE	n	SE	n	SE	
1969	515*	N/A	1		505	N/A	1		520	14	3
1970	502.6*	15.45	5	516	N/A	1		469	8	5	
1971	453.7	23.9	3								
1972											
1973											
1974											
1975											
1976											
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1978											
1979											
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1982											
1983											
1984											
1985											
1986											
1987											
1988											
1989											
1990											
1991											
1992											

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Year	0.3		0.4		0.7		1.1		1.2		1.3		1.4		2.1		2.2		2.3		2.4		3.1		3.3		SE	n	
	SE	n																											
1969																													
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1987																													
1988																													
1989																													
1990																													
1991																													
1992																													

Female mean weight (kg) by brood year

Year	0.3		0.4		0.7		1.1		1.2		1.3		1.4		2.1		2.2		2.3		2.4		3.1		3.3		SE	n	
	SE	n																											
1969																													
1970																													
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1991																													
1992																													

Appendix E cont'd (Mikfik: page 3 of 4).

Year	Age Group													
	0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3
Male harvest (number of fish) by brood year														
1976										1386				
1977						4552								
1978					990									
1979														93
1980							186			279	---		---	
1981						10869	---		1208	---		---		
1982			---		3995	---			---	---	131			
1983		---			---	3892		---	352		314			
1984	---			---	2676	2933			382		782			
1985					355	1965			313		122			
1986					2188	3897			950		252			
1987					853	1730			37		37			
1988					141	197			25					
1989					185						5			
1990				4		36			2					
1991					21									
1992				1										
Female harvest (number of fish) by brood year														
1976										1782				
1977						7324								
1978					1979									
1979														---
1980										372	---		93	
1981						5852	---		1394	---		---		
1982		93	---		3066	---			---	---	42			
1983		---			---	3746		---	381		164			
1984	---			---	3420	2129			355		447			
1985					368	1541			201		292			
1986					1629	3776			1583		134			
1987					1413	1469			37		29			
1988					163	209			27					
1989					213						1			
1990				15		35			3					
1991		1				31								
1992														

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Year	Age Group																												
	0.3	n	0.4	n	1.1	n	1.2	n	1.3	n	1.4	n	2.1	n	2.2	n	2.3	n	2.4	n	3.1	n	3.2	n	3.3	n			
	Male age composition by harvest year																												
1975						55.56	5	11.11	1						11.11	1													
1976						13.53	3	4.33	1						4.33	1													
1977																													
1978																													
1979																													
1980						22.10	15	17.60	12						1.50	1													
1981																													
1982						5.50	5	25.27	23								7.69	7											
1983																													
1984																													
1985																													
1986						14.53	43	39.52	117	0.68	2				4.39	13	1.01	3								0.34	1		
1987																													
1988						18.28	130	26.58	190						2.40	17	0.89	6											
1989						5.07	26	41.90	215						5.46	28	4.49	23											
1990						24.12	98	21.67	88						3.45	14	8.63	35											
1991						6.62	35	30.24	160						7.37	39	0.95	5											
1992						3.56	19	43.65	233						0.93	5	6.36	34											
1993			0.43	2		19.66	96	20.94	102						2.66	13	3.93	19											
1994																													
1995																													
	Female age composition by harvest year																												
1975						11.11	2	11.11	1																				
1976						45.45	10	12.15	4						13.64	3													
1977																													
1978																													
1979																													
1980						22.10	15	33.80	23						2.90	2													
1981																													
1982						10.99	10	40.66	37								9.89	9											
1983																													
1984																													
1985																													
1986	0.34	1				11.15	33	21.28	63						5.07	15	1.35	4								0.34	1		
1987																													
1988						23.36	161	25.59	181						2.60	18	0.29	2											
1989						5.26	27	30.41	156						5.07	26	2.34	12											
1990						17.97	73	17.00	69						2.22	9	4.93	20											
1991						10.97	58	29.30	135						12.28	65	2.27	12											
1992						4.11	22	37.07	198						0.93	5	3.38	18											
1993			1.59	8		22.64	110	22.21	108						2.87	14	3.08	15											
1994																													
1995																													
	Both Sexes																												
1975						66.67	6	22.22	2						11.11	1													
1976						59.08	13	22.73	5						18.19	4													
1977																													
1978																													
1979																													
1980						44.20	30	51.40	35						4.40	3													
1981																													
1982						16.49	15	65.93	60								17.58	16											
1983																													
1984																													
1985																													
1986						25.68	76	60.80	180	0.68	2				9.46	28	2.36	7								0.34	1	0.34	1
1987																													
1988						41.64	291	52.17	371						5.00	35	1.18	8											
1989						10.33	53	72.31	371						10.53	54	6.83	35											
1990						42.10	171	38.67	157						5.67	23	13.56	55											
1991						17.59	93	39.54	315						19.63	104	3.22	17											
1992						7.67	41	80.72	431						1.86	10	9.74	32											
1993			2.02	10		42.30	206	43.15	210						5.53	27	7.01	34											
1994																													
1995																													

Appendix F. Names and locations of files used to generate this report. All files are stored on the hard drive of the Dell Dimension XPS H233 research computer (property number 10074778), and backed up on 3.5" floppy diskettes.

File name	Subdirectory	Format	Description
95SALAWL.RIR	D:\REPORTS\SALMON\AWL	Word 97	Text and tables (minus appendices) for the 1995 LCI salmon AWL Regional Information Report
95APENDX.XLS	D:\REPORTS\SALMON\AWL	Excel 97	Appendices for the 1995 LCI salmon AWL Regional Information Report
95SALAWL.FIG	D:\REPORT\SALMON\AWL	Powerpoint 97	Figures 1 and 2 for the 1995 LCI salmon AWL Regional Information Report

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